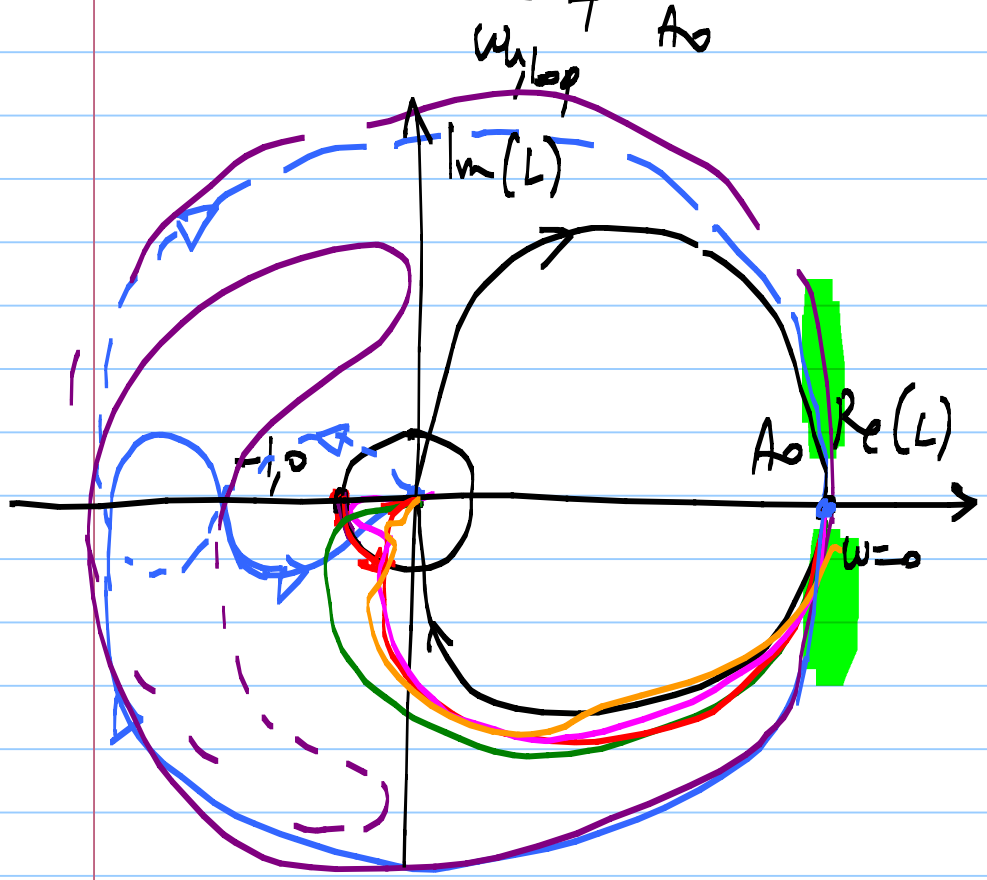
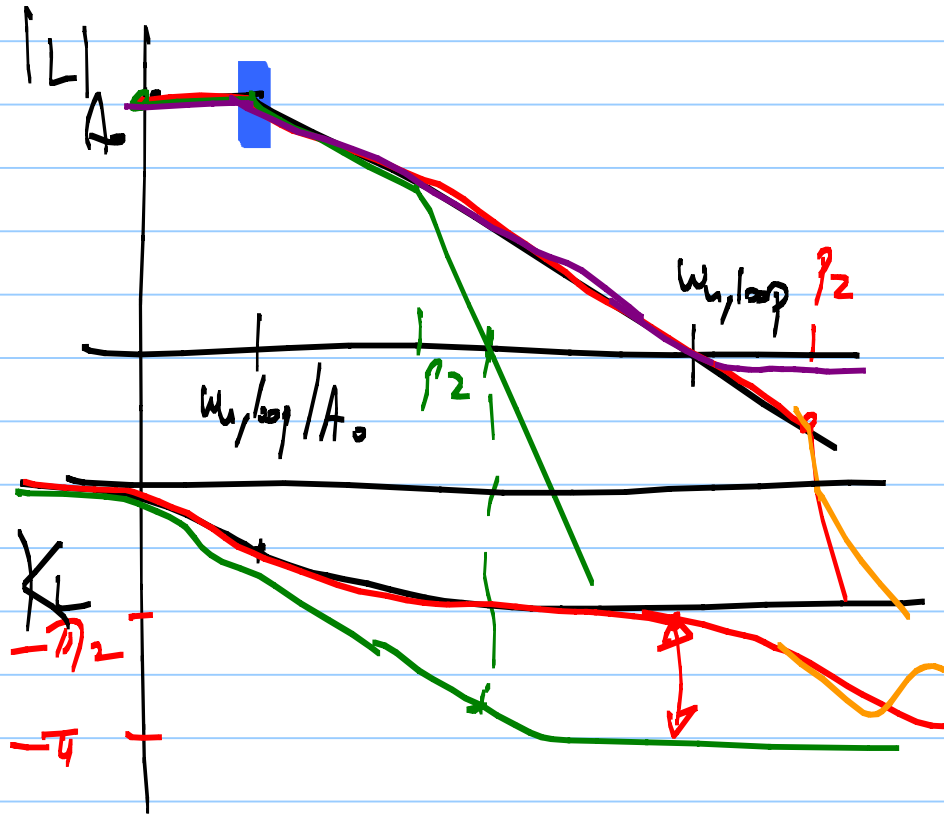
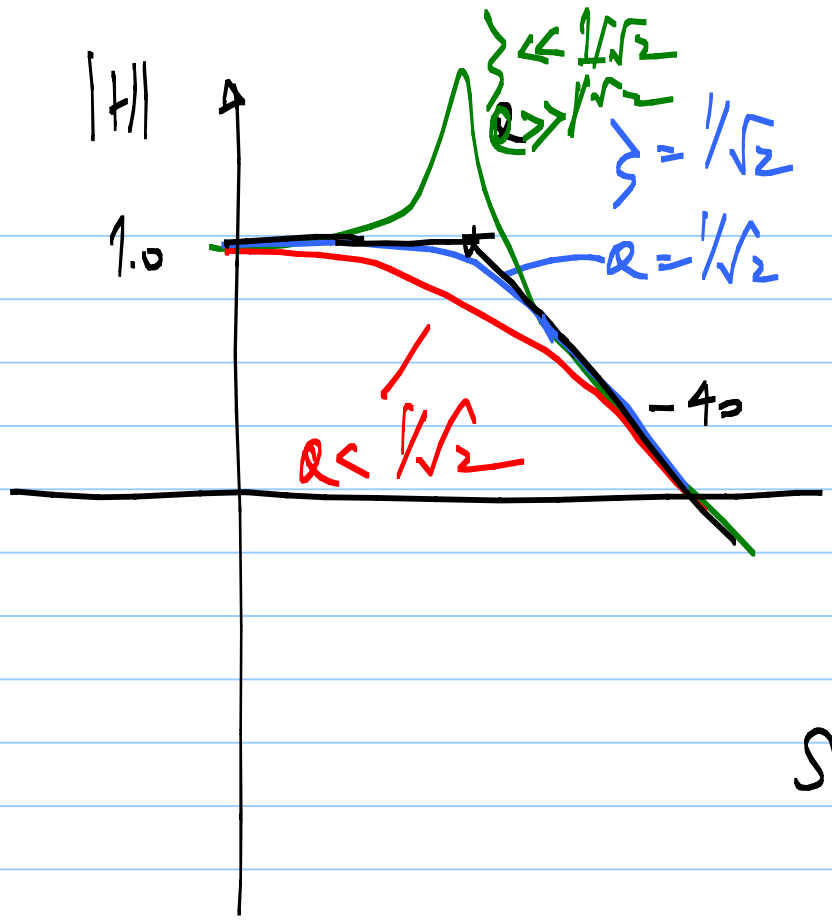
Lecture 41

Single pile: $\dfrac{1}{\frac{s}{\omega_{u,loop}} + \frac{1}{A_0}} = L(s)$ 11/4/2016 $\dfrac{A_0}{\left(1+\frac{s}{p_1}\right)\left(1+\frac{s}{p_2}\right)}$



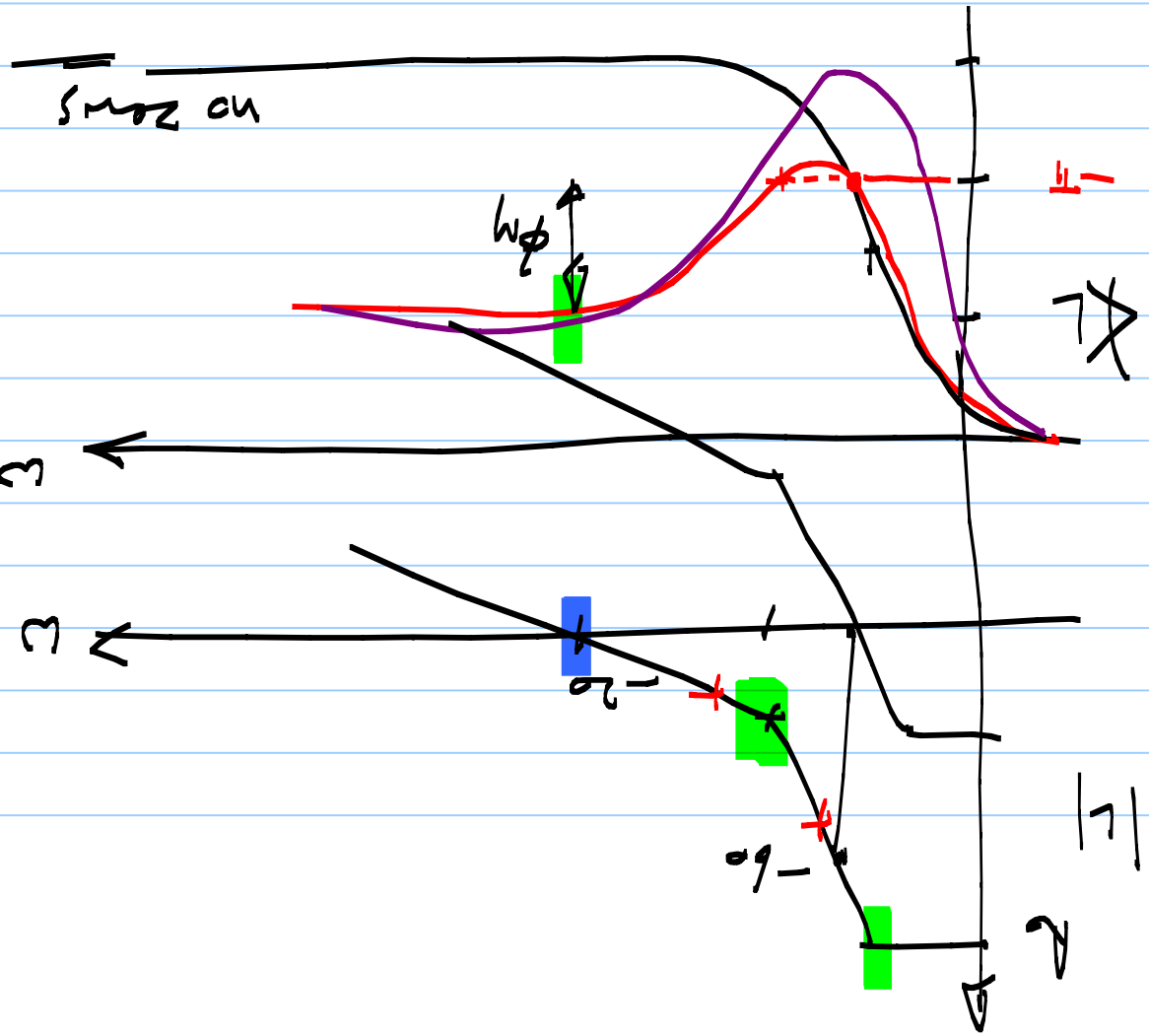




$$H = \frac{1}{\frac{s^2}{\omega_0^2} + \frac{s}{Q\omega_0} + 1}$$

$$\frac{1}{\frac{s^2}{\omega_0^2} + 2\zeta\frac{s}{\omega_0} + 1}$$

Stability margin: min. value of $|1 + L|$



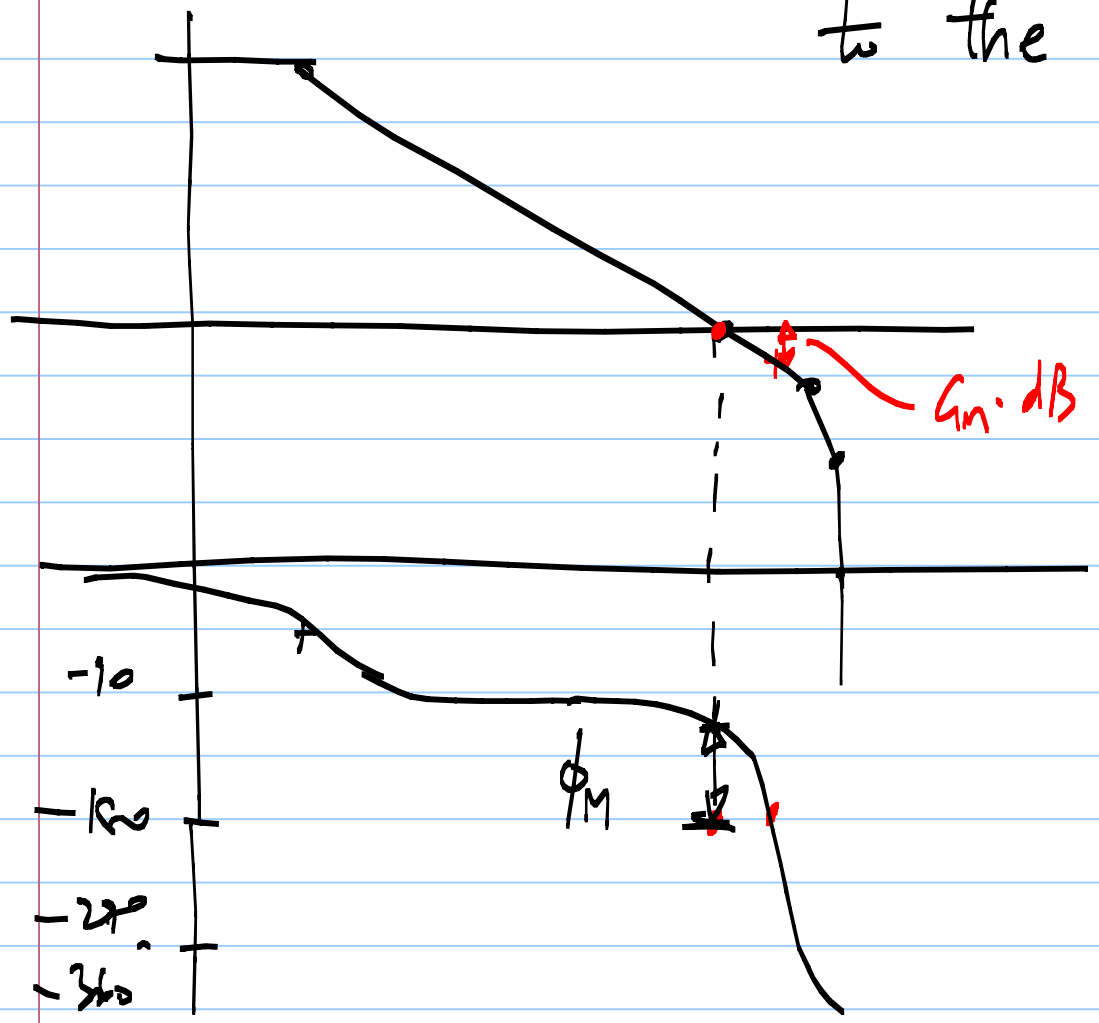
$$\frac{\left(\omega_1/5+1\right)}{\left(\omega_2/5+1\right)}\cdot\frac{K_1}{K_2}$$

$$\left[\left(\frac{L}{1+L}\right)\right]_{\frac{-10}{1-10}} = \frac{10}{9}$$

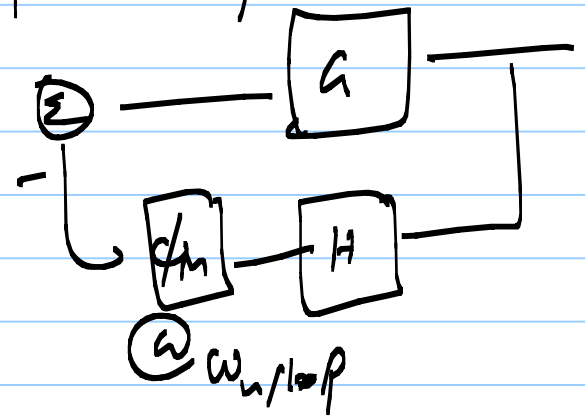
$L < -1$

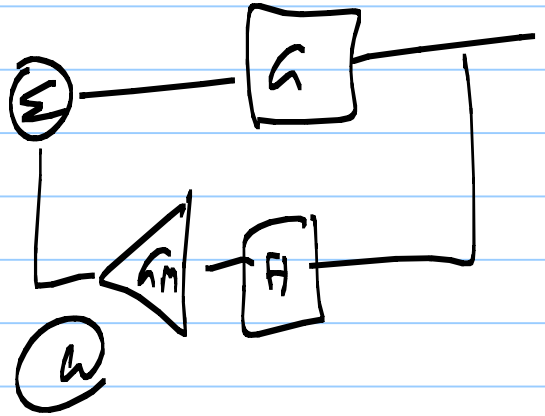
$L = -10$

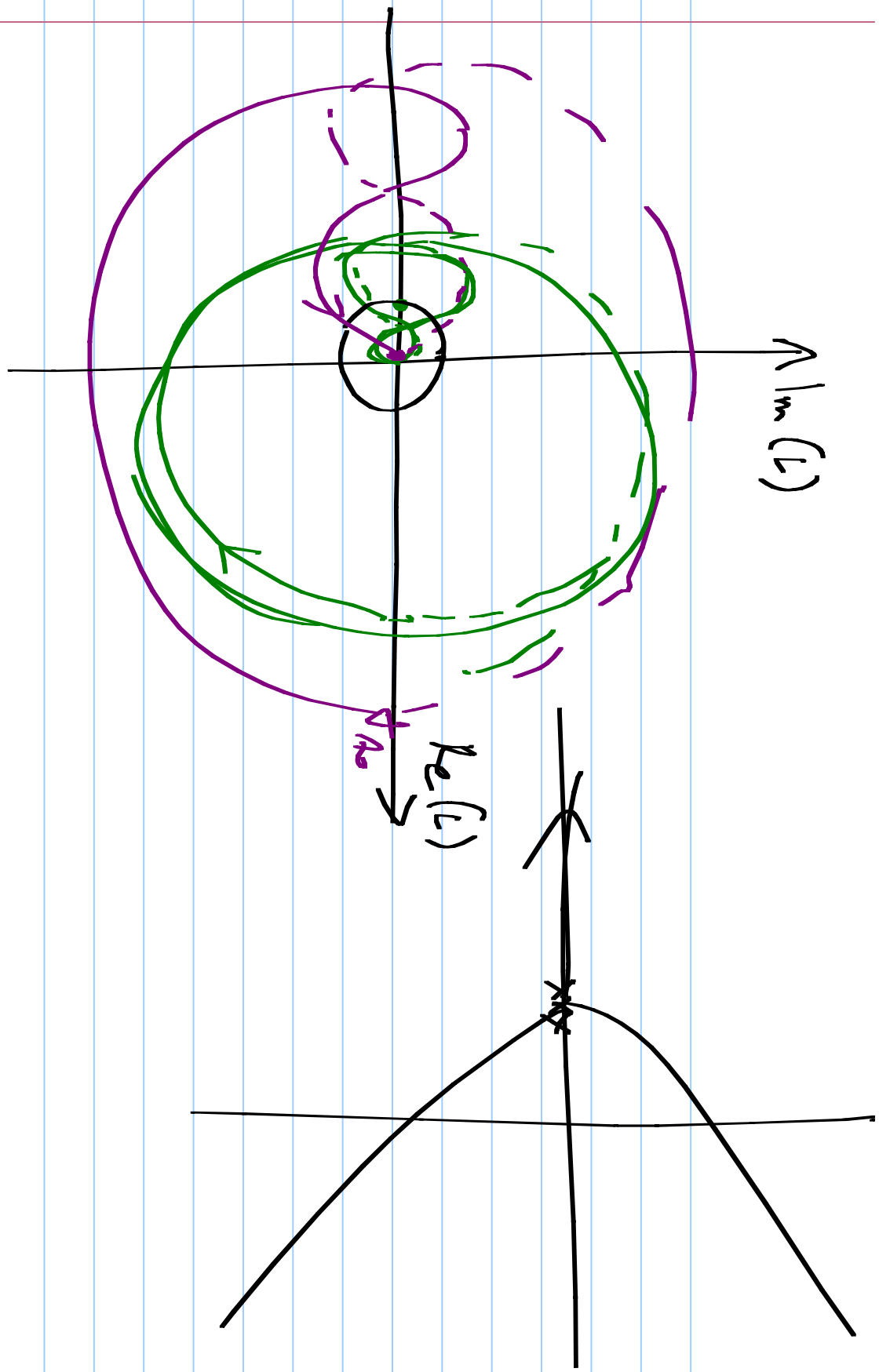
All pole loop gain

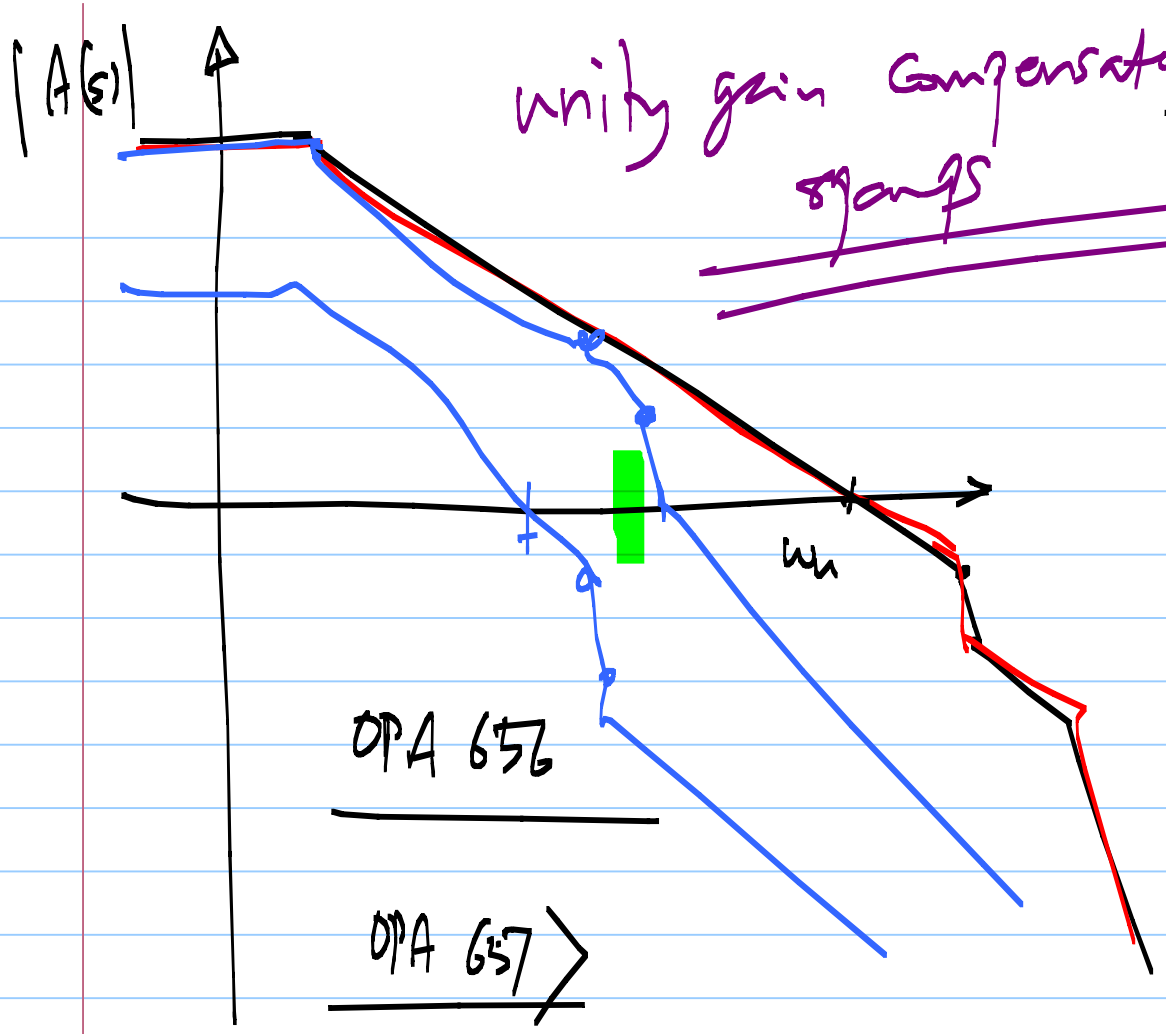


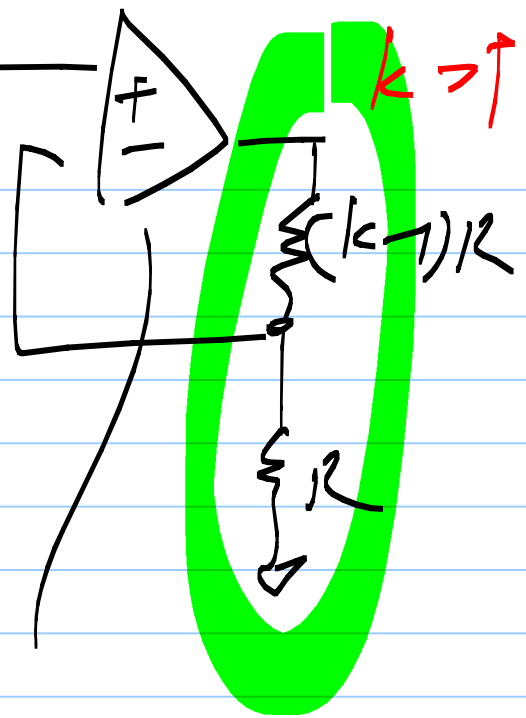
Add a phase shift of ϕ_M @ $\omega_{u/loop}$ to the fb loop






Im(L)
Re(L)

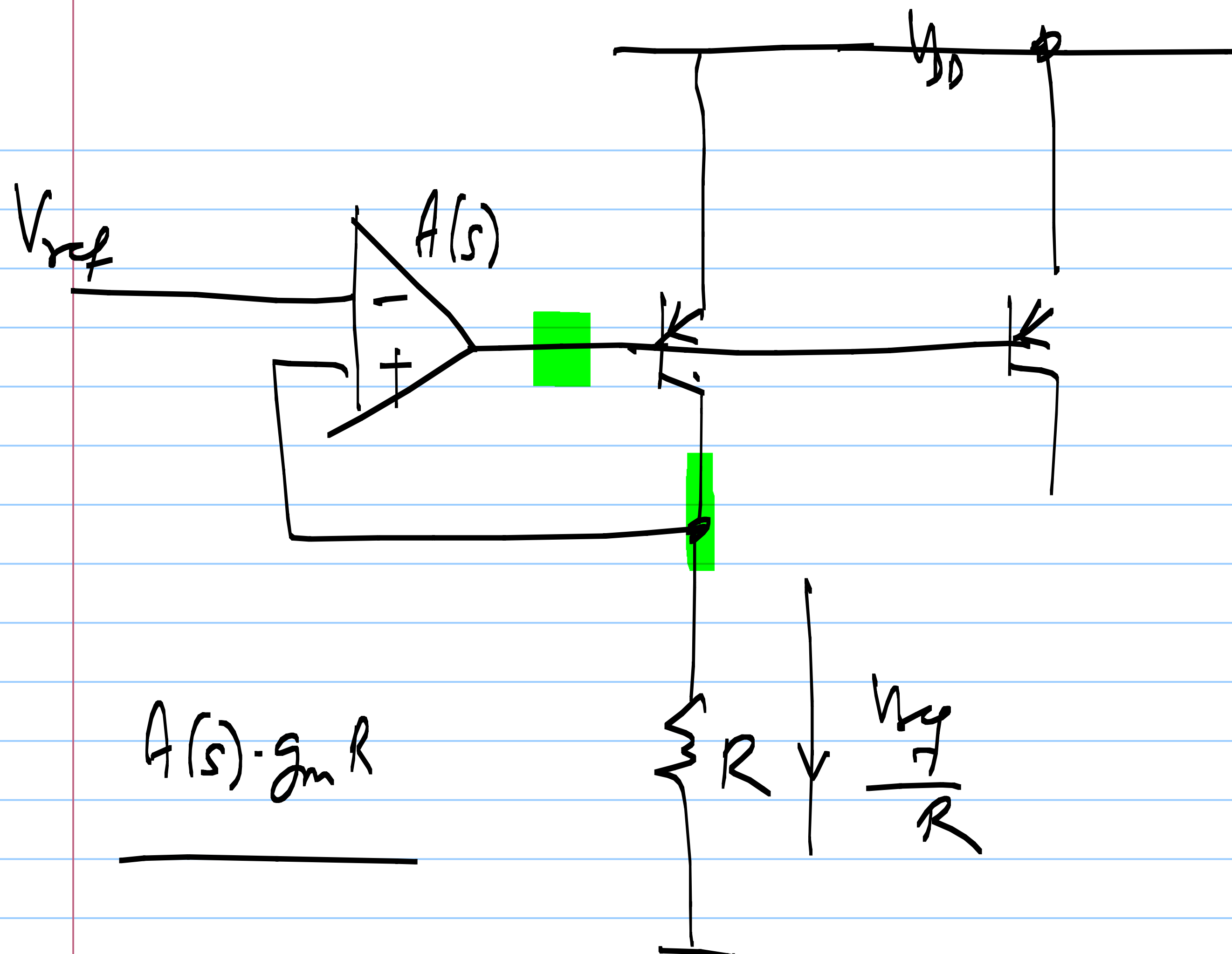




LF347: 4MHz

k=1 : 4MHz

k=4 : 1MHz

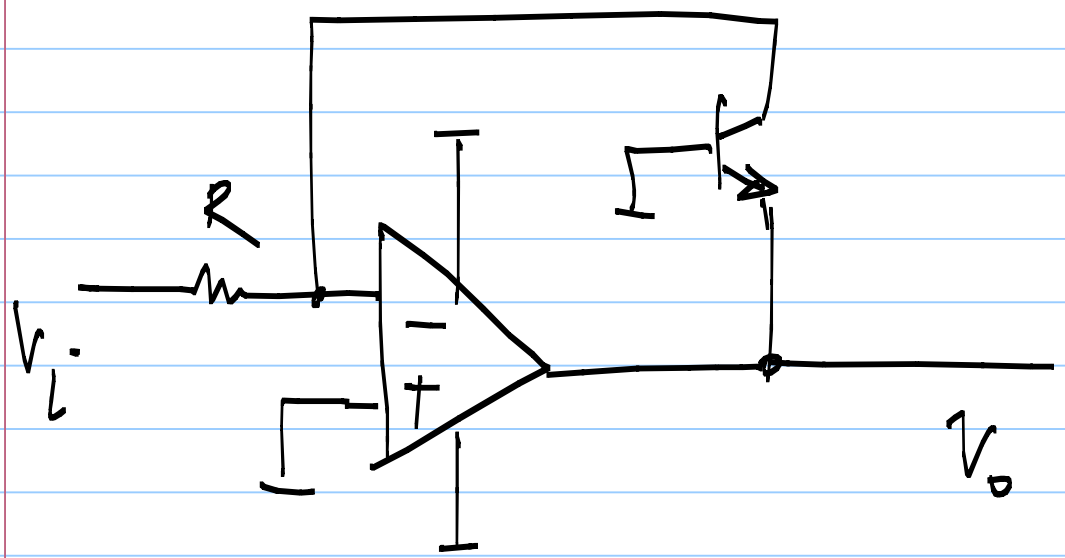


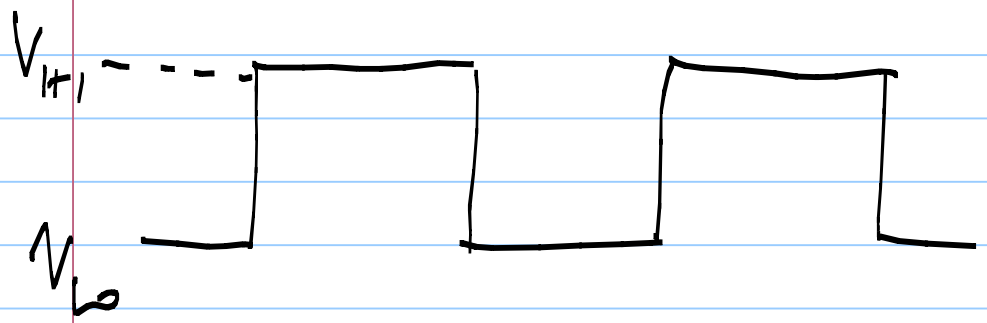
$A(s) \cdot g_m R$

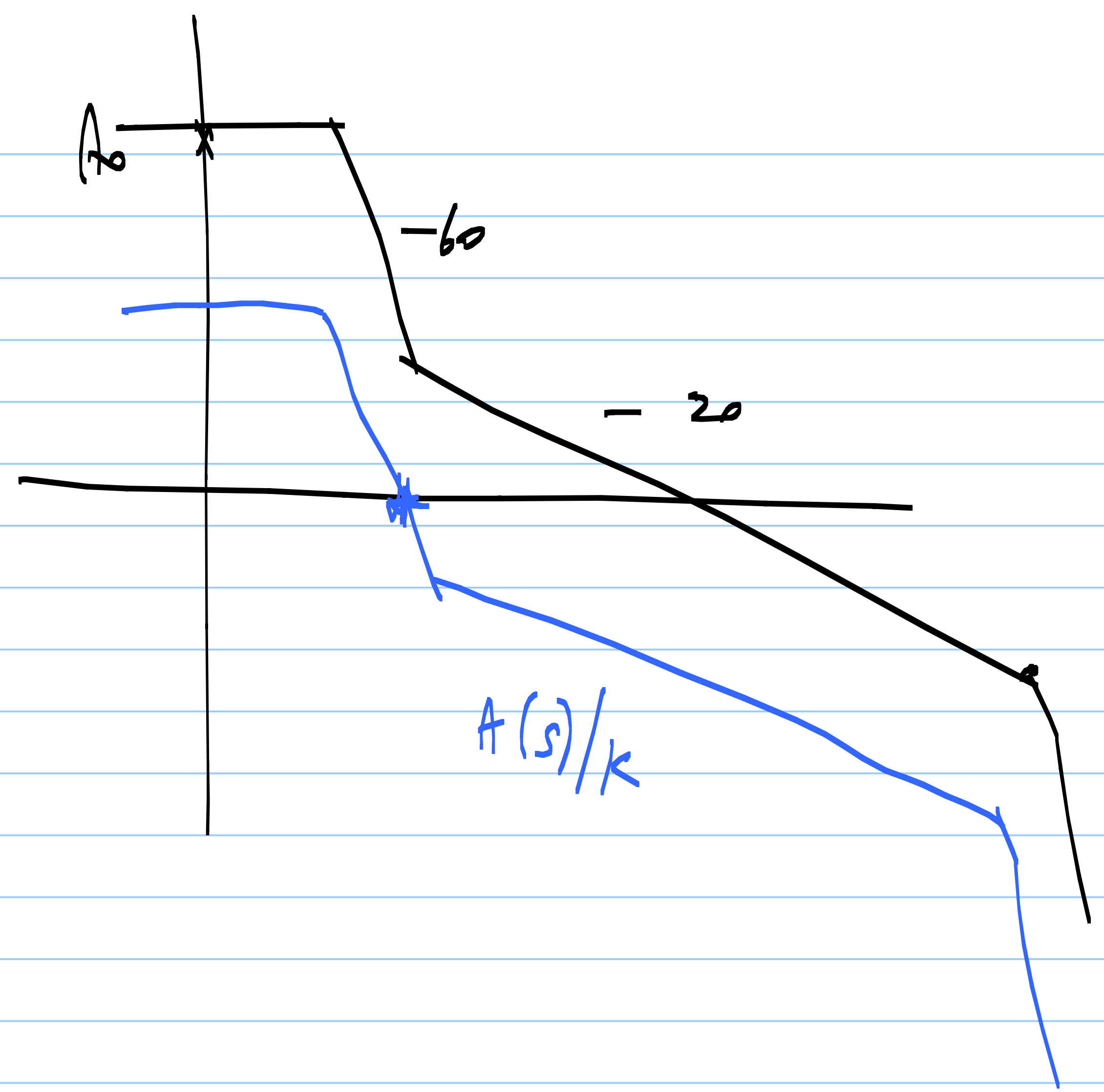
$$I_C \propto I_S \exp\left(\frac{V_{BE}}{V_t}\right)$$

1) Calculate V_o

2) calculate the output V_o







A₀
-60
-20
A(s)/K